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Numerical simulation of Schlichting streaming induced by standing wave in rectangular enclosure

Gubaidullin D., Osipov P., Nasyrov R.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. Acoustic streaming of incompressible fluid induced by standing wave in rectangular computational region is simulated. The impact of width of computational region on Schlichting vortices is analyzed. The Crank-Nickolson scheme across region is used to solve Prandtl equations. The upper boundary of computational region simulates the extern flow via Neumann homogeneous condition. The mean velocity field over large number of cycles is computed. It is shown that to achieve proper mean velocity and appearance of Schlichting vortices the width of computation region must be more than 8 times of thickness of acoustic boundary layer.

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